21792

National Library of Canada | Bibliothèque nationale du Canada

CANADIAN THESES ON MICROFICHE | THÈSES CANADIENNES SUR MICROFICHE

NAME OF AUTHOR/NOM DE L'AUTEUR James Hubert Copeland

TITLE OF THESIS/TITRE DE LA THÈSE A Study Of Broiler Marketing In Alberta

UNIVERSITY/UNIVERSITÉ Univ. Of Alberta

DEGREE FOR WHICH THESIS WAS PRESENTED/ GRADE POUR LEQUEL CETTE THÈSE FUT PRÉSENTÉE M. Sc.

YEAR THIS DEGREE CONFERRED/ANNÉE D'OBTENTION DE CE DEGRÉ 1974

NAME OF SUPERVISOR/NOM DU DIRECTEUR DE THÈSE Dr. M. H. Hawkins

Permission is hereby granted to the NATIONAL LIBRARY OF CANADA to microfilm this thesis and to lend or sell copies of the film.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

L'autorisation est, par la présente, accordée à la BIBLIOTHÈQUE NATIONALE DU CANADA de microfilmer cette thèse et de prêter ou de vendre des exemplaires du film.

L'auteur se réserve les autres droits de publication; ni la thèse ni de longs extraits de celle-ci ne doivent être imprimés ou autrement reproduits sans l'autorisation écrite de l'auteur.

DATED/DATÉ Aug. 2, 1974 SIGNED/SIGNÉ James H Copeland

PERMANENT ADDRESS/RÉSIDENCE FIXÉ 216 Crown Road Apt. 325
Edmonton, Alberta

NL-91 (11-73)

THE UNIVERSITY OF ALBERTA

A STUDY OF BROILER MARKETING IN ALBERTA

by

JAMES HUBERT COPELAND

(C)

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF SCIENCE

DEPARTMENT OF AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

EDMONTON, ALBERTA

FALL, 1974

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read and recommend to the Faculty of Graduate Studies for acceptance a thesis entitled "A Study of Broiler Marketing in Alberta," submitted by James H. Copeland in partial fulfilment of the requirements for the degree of Master of Science.

.....

Supervisor

.....

.....

.....

Date June 21, 1974.

ABSTRACT

Broilers like many other food products do not enjoy a stable demand throughout the year even though they are available in ample supply during the entire year. Price instability in the market place would likely result if the seasonal changes in demand were not accompanied by compensating changes in quantity supplied (production). As well as seasonal changes in the total demand for broiler chicken there are seasonal shifts in demand for the various forms (whole, cut-up, nine-piece, or segments) in which chicken is marketed. Seasonal differences in the volume of chicken sold through various outlets and in the volume of chicken exported also exist.

Knowledge of the seasonal patterns of demand for broilers is of limited value, however, unless an effort is made by all those involved in the marketing process to adjust supply to the seasonal pattern of demand. Such adjustment requires forecasting of future sales a minimum of thirteen weeks in advance of expected changes in demand. Development of improved forecasting techniques permits annual sales to be predicted within a 2 percent error level up to one year in advance. Success in translating the forecasted sales into production adjustments is subsequently dependent upon regulation of the interprovincial movement of

product, and the ability to prevent the dumping of product in a market area thus disrupting the orderly marketing process.

ACKNOWLEDGEMENTS

Research into the marketing practices of an industry would be impossible without the cooperation and assistance of those in the industry. I wish to thank: (1) the Alberta Broiler Growers' Marketing Board and the Alberta Agricultural Research Trust Fund for making the research financially possible; (2) Wally Landreth and Don Potter of the Alberta Broiler Growers' Marketing Board for their most valuable comments and for introducing a "green-horn to a fascinating industry; (3) and, the processors of Alberta (Alberta Poultry Marketers' Cooperative Ltd., Canada Packers, and Pinecrest Foods) for opening their books, making the analysis of sales invoices possible.

In today's complex world one must in his endeavours rely upon others for expert assistance. I am indebted to the members of my committee for their valuable comments, Dr. R.T. Hardin for his assistance in the analysis of variance, Ronn Bence for his fine graphics for work, Evelyn Shapka for editing the many drafts of this thesis, and Lea Cartmell for typing the tables.

Working with Dr. M.H. Hawkins has been one of the most rewarding experiences of my life; Dr Hawkins goes far beyond the professor-student relationship and accepts one as a colleague working jointly on a research project. He also

takes a deep interest in his student's personal welfare. While it is totally inadequate, thank you very much Dr. Hawkins it has been a most enjoyable experience working with you.

A vote of thanks is owing Clare Shier and Helen Kuzyk for carrying my work load while I completed this project and also for their continual encouragement to see the project to completion.

Finally, I must thank my parents for their sacrifices and encouragement throughout my education and Allan Halvorson for arousing my initial interest in agriculture as a profession.

TABLE OF CONTENTS

PAGE

ABSTRACT iv

ACKNOWLEDGEMENTS vi

LIST OF TAELES x

LIST OF FIGURES xi

CHAPTER

I. INTRODUCTION 1

Importance of the Broiler Industry to Alberta 1
Objectives of the Study 2
Current Problems in the Industry 2
Data Collection 3
Weaknesses of the Data 3
Organization of the Thesis 4

II. MARKETING AND MARKET PERFORMANCE 6

Definition of Marketing and Markets 6
Marketing Models 7
Market Analysis 10
Measures of Market Performance 11

III. THE ALBERTA BROILER INDUSTRY 15

Structure 15
Geographic Market Area 19
The Alberta Broiler Growers' Marketing Board 22
Conduct -- Roles of the Board 25
Summary 28

IV. COMPOSITION AND SEASONALITY OF ALBERTA BROILER SALES 29

Statistical Analysis 31
Seasonality of Sales 33
Sales Outlets and Seasonality 35
Composition of Sales by Various Outlets 35
Seasonality, Porm, and Outlet of Export Sales 38
Summary 42

V. PLANNED PRODUCTION AND ORDERLY MARKETING 43

Sales Forecasting 46
Supply Management and Market Information 55
Inventory Control 57
Interprovincial Movement of Broilers 60
Concluding Comments 64

VI. CONCLUSIONS AND RECOMMENDATIONS 65

Conclusions 65
Recommendations 68
Recommendations for Further Research 69

SELECTED REFERENCES 72

APPENDIX A 75

LIST OF TABLES

TABLE		PAGE
3.1	Distribution of Alberta Broiler Production Facilities, 1971	16
3.2	Concentration in Processing	17
4.1	Sources of Variation in Alberta Broiler Sales	32
4.2	Seasonal Indices of Alberta Broiler Sales	33
4.3	Distribution of Average Daily Broiler Sales by Season and Form Sold	34
4.4	Distribution of Average Daily Broiler Sales by Season and Outlet	36
4.5	Distribution of Average Daily Broiler Sales by Outlet and Form Sold	37
4.6	Distribution of Average Daily Broiler Sales by Destination and Form Sold	39
4.7	Distribution of Average Daily Broiler Sales by Destination and Outlet	40
4.8	Distribution of Average Daily Broiler Sales by Destination and Season	41
5.1	Comparison of Seasonal Index Forecasts for 1971	49
5.2	Comparison of 1971 Forecasts Using Dummy Variables	54
5.3	Price for Interprovincial Movement of Broilers	62

LIST OF FIGURES

FIGURE		PAGE
3.1	Major Market Channels for Ready-to-Cook Broilers in Alberta, 1968-70	18
3.2	Major Marketing Channels for Ready-to-Cook Broilers in the United States, 1969	20
3.3	Geographic Market Area for Alberta Broilers, 1968-70	21
3.4	Breakdown of Board Administration Costs, 1972	24
5.1	Weekly Difference Between Marketings and Consumption of Alberta Broilers, 1971-72	58
5.2	Weekly Inventory of Alberta Broilers, 1971-72	59

CHAPTER I

INTRODUCTION

Importance of the Broiler Industry to Alberta

There were 115 producers licensed by the Alberta Broilers Growers' Marketing Board[1] during 1971 for the production of broiler chickens.[2] The producers had 2,306,000 square feet[3] of authorized production facilities from which they marketed 11,125,658 birds or 32,906,000 pounds of eviscerated chicken. Alberta production was worth $8,613,397 to the producers[4] and accounted for 1.1 percent of total farm cash receipts during 1971. In comparison, other poultry and eggs acccunted for 3.38 percent while hogs accounted for 10.85 percent of total farm cash receipts.

Broilers accounted for 59 percent of the manufacturing activity of poultry processors in Canada during 1969. The six processors in Alberta employed 465 people in 1969 and paid out $2,019,000 in wages.[5]

---

[1] Hereafter referred to as the "Board".

[2] A broiler chicken is defined as any chicken under six months of age which was not raised for the purpose of egg production.

[3] Report to the Fifth Annual General Meeting of Producers Registered under the "Alberta Broiler Growers' Marketing Plan 1965," Calgary, Alberta, 1971, p. 8.

[4] Alberta Broiler Growers' Marketing Board, Weekly Report to Processors (Edmonton, Alta.: Broiler Growers' Marketing Board, 1971).

[5] Statistics Canada, Survey of Poultry Processors, Annual Census, Cat. No. 32-227 (Ottawa: DBS,1969).

Objectives of the Study

The principle objective of the study was to examine various aspects of the marketing of broiler chickens and to make recommendations on positive guidelines to improve the marketing of broilers and to increase operational efficiency in the industry.

A secondary aim of the study was to provide background knowledge on the broiler market to enable future research into expanding the demand for broiler chickens. An attempt was also made to identify areas where such research should be directed.

Current Problems in the Industry

Some of the problems faced by the broiler industry in Alberta are:

1. Forecasting future sales accurately and realizing their seasonality in order to coordinate production to meet expected demand.

2. Knowing the probable results of a decision in order to fix marketing quotas at a certain level.

3. Determining the level of inventories to be maintained to adequately service customers at a minimum of cost.

4. Ascertaining the composition of the above inventories.

5. Overcoming the lack of information regarding the market for broilers in Alberta.

6. Studying the interprovincial movement of broilers and its impact on supply management practices.

Data Collection

The primary source of data for much of the study was the Weekly Report to Processors by the Alberta Broiler Growers' Marketing Board for the period January 1, 1967 to December 31, 1971. Additional data for the analysis of composition and seasonality of demand for the product were obtained by sampling the sales invoices of four processors in the province. Sampling involved the recording of all sales for each processor for one day of each week selected at random during the period September 1, 1968 to August 31, 1970. The sample included approximately 35,000 sales invoices representing 10.45 percent of sales during the period.

Weaknesses of the Data

Sales invoices for four licensed processors (who account for 93.9 percent of chickens processed in Alberta)

were studied. It must be noted that one processor omitted from the study processed 1.65 percent of the total in Alberta during 1970. This was sold entirely to the take-out restaurant trade in Calgary. Another weakness was that the major retail chain stores tend to have all their orders shipped on the same day. To partially overcome the problem the day the order was placed with the processor was used as the deciding factor for sampling rather than the date of shipment.

Data contained in the Weekly Report to Processors are compiled from the information supplied by each of the licensed operators in Alberta. Therefore, the information is only as accurate as the individual reports going into the Report's construction.

Organization of the Thesis

The following chapter contains a discussion of the concepts of marketing and the means used to measure overall market performance. Chapter III applies the concepts of structure and conduct (as introduced in Chapter II) to the Alberta broiler industry. The results of the sales invoice survey to determine the composition and seasonality of demand for broilers is presented next. An analysis of alternative means of forecasting broiler sales to facilitate planning for orderly production to meet the needs of the

Alberta market is contained in Chapter V. A proposal to regulate the interprovincial movement of broilers in order to prevent "dumping" of product from disrupting the orderly marketing of broilers within the province is also presented. A summary of results and recommendations for further research are presented in Chapter VI.

CHAPTER II

MARKETING AND MARKET PERFORMANCE

Definition of Marketing and Markets

There is agreement only in principle among the authorities as to the definition and role of marketing. Production and marketing both require a continuous chain of services and as such, there is no clear division as to where one ends and the other begins. Economists have defined production and marketing as the creation of utility (form utility, place utility, time utility or possession utility).

Various authors place different emphasis on what marketing should include. Kohls and Downey define marketing as:

> The performance of all business activities involved in the flow of goods and services from the point of initial agricultural production until they are in the hands of the ultimate consumer.[1]

Beckman and Davidson offer the following definition:

> Marketing is the process by which the demand structure for economic goods and services is anticipated or enlarged and satisfied through the conception, promotion, exchange, and physical distribution of such goods and services.[2]

A third definition is stated as follows:

> Marketing is the economic process by means of which goods and services are exchanged and their

---

[1] Richard L. Kohls and W. David Downey, Marketing of Agricultural Products (4th Ed.; New York: The Macmillan Company, 1972), p. 8.

[2] Theodore N. Beckman and William R. Davidson, Marketing (8th Ed.; New York: The Ronald Press Company, 1967), p. 4.

values determined in terms of money and prices.[1]

All three definitions are in general agreement. However, the third definition emphasizes that marketing is more than physical movement and changes in form of commodities. Prices and values, the principal subject matter of economics, are included. Marketing is (1) providing consumers with goods and services in the form, place, and time demanded by them, and (2) providing for an intricate system of pricing and communication between producer and consumer. Broiler producers and consumers perform a variety of operations that add utility to the product. But only marketing establishes prices and values. Consequently, a market may be defined as:

> A sphere in which price making forces operate and in which exchanges of title tend to be accompanied by the actual movement of the goods affected.[2]

Marketing Models

The perfectly competitive model has received a great deal of attention from agricultural economists when examining the efficiency with which marketing is carried out within the agricultural sector. Ferguson defines the perfectly competitive model as:

An economic model of a market possessing the

---

[1] Willard F. Williams and Thomas T. Stout, Economics of the Livestock - Meat Industry (New York: The MacMillan Co., 1964), p. 110.

[2] Beckmen and Davidson, Marketing, p. 4.

> following characteristics: each economic agent is so small relative to the market that it can exert no perceptible influence on price; the product is homogeneous; there is free mobility of all resources, including free and easy entry and exit of business firms; and all economic agents in the market possess complete and perfect knowledge.[1]

While the perfectly competitive model closely approximates many segments of the agricultural industry the model is severely limited when examining the broiler industry in Alberta. Competition imposes restraints on individual firms within an industry which may prohibit the firms from specializing or expanding in order to take advantage of cost-saving technology. Competition limits the market demand available to the individual firm.[2]

The ideal situation would be to have both perfect competition and full utilization of specialization and scale economies. Professor J.M. Clark, recognizing that such a cure-all was rarely possible, presented his concept of workable competition.[3] Workable competition focused on the feasible as opposed to the ideal of the perfectly competitive model. Clark later extended his work toward effective competition.[4]

---

[1] C.E. Ferguson, Microeconomic Theory (3rd Ed.; Georgetown, Ont.: Irwin-Dorsey Ltd., 1972), p. 252.
[2] Allan A. Warrack, "A Conceptual Framework for Analysis of Market Efficiency," Canadian Journal of Agricultural Economics, Vol. 20, No. 3 (1972), 9-21.
[3] J.M. Clark, "Toward a Concept of Workable Competition," American Economic Review, XXX (1940), 241-256.
[4] J.M. Clark, Competition as a Dynamic Process (Washington, D.C.: The Brookings Institute, 1961).

Sosnick[1] developed a list of criteria aimed at giving a concrete concept of effective competition as opposed to Clark's workable competition. Effective competition as presented by Sosnick exists only if a market is free from twenty-five conditions which are undesirable and avoidable. The twenty-five conditions or flows are broken down into those which are undesirable both in themselves and in their effects and those which are undesirable only because of their effects. Ten market characteristics are undesirable both in themselves and in their effects. Seven deal with performance and three deal with market conduct: (1) unsatisfactory products, (2) underuse or overuse, (3) inefficient exchange, (4) inefficient production, (5) bad externalities, (6) spoliation, (7) exploitation, (8) unfair tactics, (9) wasteful advertising, and (10) irrationality.

Fifteen market conditions are undesirable only because of their effects. The first relates to performance, the next eleven relate to conduct, and the last three relate to structure: (1) undue profits or losses, (2) inadequate research, (3) predation, (4) preemption, (5) tying arrangements, (6) resale price maintenance, (7) refusals to deal, (8) undesirable discrimination, (9) misallocation of risk, (10) undesirable collaboration, (11) undesirable

---

[1] Stephen H. Sosnick, "Toward a Concrete Concept of Effective Competition," American Journal of Agricultural Economics, Vol. 50, No.4 (November, 1968), 827-853.

mergers, (12) undesirable entry, (13) misinformation, (14) inefficient rules of trading, and (15) misregulation.[1]

Market Analysis

The basic hypothesis of market analysis is that market structure and market conduct are separable variables, each affecting market performance. While emphasis is given to effects of structure on performance, the influence of conduct is also recognized.

Market structure refers to those characteristics of the organization of a market which seem to influence strategically the nature of competition and pricing within the market.[2] According to Caves[3] the main elements of market structure are: (1) concentration, (2) product differentiation, (3) barriers to the entry of new firms, (4) growth rate of market demand, (5) price elasticity of market demand, and (6) ratio of fixed to variable costs in the short run.

Market conduct refers to patterns of behavior followed by enterprises in adapting or adjusting to the markets in

---

[1] Sosnick, "Toward a Concrete Concept of Effective Competition."

[2] Joe S. Bain, Industrial Organization (New York: John Wiley and Sons, Inc., 1959), p. 7.

[3] Richard Caves, American Industry: Structure, Conduct, Performance (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1967), p. 16.

which they sell (buy).[1] Conduct consists of business policies aimed at (1) setting prices, (2) setting the quality of the product, and (3) coercing rivals.[2] Low prefers to divide the conduct variables into the three categories of price, quality and advertising.[3] Williams and Stout also include the quantity of output and methods of coordinating procurement, production and sales as elements of market conduct.[4]

Measures of Market Performance

As marketing involves two functions, its performance is dependent upon the efficiency with which those functions are performed. Two measures are required. Physical or operational (technological) efficiency measures the output of useful marketing services relative to inputs of labor, capital, and other resources utilized in marketing; that is, the value added or margin per unit of input of these factors. Pricing (exchange)[5] efficiency measures the

---

[1] Bain, Industrial Organization, p. 9.
[2] Caves, American Industry: Structure, Conduct, Performance, p. 38.
[3] Richard E. Low, Modern Economic Organization (Homewood, Illinois: Richard D. Irwin, Inc., 1970), p. 215.
[4] Williams and Stout, Economics of the Livestock Meat Industry, p. 147.
[5] As Beckman has pointed out, marketing involves the exchange of titles which really involves three dimensions: price, quantity, and quality of product. While pricing efficiency is the most important component, the term exchange efficiency will be used to emphasize the multiplicity of exchange. For more details see: Warrack, "A Conceptual Analysis of Market Efficiency."

efficiency with which prices perform the functions expected of them, namely: (1) to allocate resources among alternate uses; (2) to allocate goods and services among potential customers; (3) to bring supply and demand into equilibrium; and (4) to produce and distribute income amongst various recipients.[1]

Operational efficiency is determined by market organization and market logistics. Market organization refers to the organization of the physical facilities used in producing marketing services. The organization includes the functional and spatial organizations of the market channel. The former refers to "who deals with whom" as the product flows through the market channel; the latter is the set of geographic locations comprising an industry. Market logistics refers to the technological and tactical alternatives that are feasible for producing marketing services as constrained by the market organization. Changes in market organization are long-run in nature. Changes in market logistics range from long-run to short-run to tactical (day to day).[2]

Exchange efficiency is determined by market structure

---

[1] Williams and Stout, Economics of the Livestock - Meat Industry, p. 123.
[2] Warrack, "A Conceptual Framework for Analysis of Market Efficiency," p. 12.
[3] Recent works prefer the term "competitive strategy" because of the ethical implications of the word "conduct".

and conduct (competitive strategy).[3] Exchange efficiency measures "how accurately, quickly and inexpensively is the performance of MS (market structure) and CS (competitive strategy) in reflecting costs in the price structure."[1]

Under the assumptions of perfect competition, exchange efficiency is maximized. The level of competition required ensures that firms operate at the lowest point on their long-run average cost curve and that "normal" zero profits are realized.[2] Assuming that scales of economy are exhausted at initial low levels of output and that the initial resource distribution is optimal, resource allocation and income distribution will be optimal.

However, in an environment such as that presented by workable competition, exchange efficiency declines as market concentration increases. The result is less than optimum resource allocation and income distribution. Each firm gains a share of the market sufficient that policy decisions of one firm directly affect the policy decisions of other firms in the industry.

The aim of every firm in an industry is to produce the maximum level of output at the least cost or at the greatest

---

[1] Warrack, "A Conceptual Framework for Analysis of Market Efficiency," p. 15.

[2] Normal zero profits indicate a level of profits adequate to maintain existing firms but low enough to discourage new entrants into the industry.

level of operational efficiency. If one firm is more successful than others, concentration is increased resulting in a further decline in exchange efficiency.

Thus market performance is a function of operational and exchange efficiency making market performance dependent upon market organization and logistics, market structure and competitive strategies, and marketing information.

CHAPTER III

THE ALBERTA BROILER INDUSTRY

Structure

A study by Hurnanen[1] in 1970 showed that a high degree of concentration existed in the marketing continuum from hatchery to processors in the Alberta broiler industry. One integrated complex was judged to control 79 percent of the hatcheries, 37 percent of the production facilities, and 81 percent of the processing facilities in the province. The concentration levels were sufficient to warrant careful scrutiny in order to prevent further acquisitions or abuse of the monopolistic powers held by the firm. Recommendations were made that the Board prevent the firm from acquiring control of any more production quota in order to maintain the degree of competition that was still present and to expand the competition as new production became available. Current Board quota allocation policies (See Appendix A) follow the recommendations. In a further effort to lessen the industry concentration the Board has received a verbal commitment from the firm to dispose of 180,000 square feet of production facilities at such time as a suitable buyer can be found.

---

[1] Roy R. Hurnanen, "Vertical Integration and Concentration in the Alberta Broiler Industry" (Unpublished M.Sc. thesis, Department of Agricultural Economics and Rural Sociology, University of Alberta, Edmonton, 1970).

There were 115 registered broiler producers in Alberta in 1971. Table 3.1 shows the distribution of size of producers. One integrated complex held 32.1 percent of the 2,354,300 square feet of authorized quota. One production facility owned by the integrated complex was larger than the facilities of the smallest 35 producers combined.

TABLE 3.1

DISTRIBUTION OF ALBERTA BROILER PRODUCTION FACILITIES, 1971

Size (sq. ft.)	Number	Relative Frequency %
less than 6,000	4	3.5
6,000- 9,999	45	39.1
10,000- 14,999	24	20.9
15,000- 19,999	13	11.3
20,000- 29,999	11	9.6
30,000- 49,999	8	7.0
50,000- 99,999	7	6.1
100,000-199,999	2	1.7
over 200,000	1	0.9
TOTAL	115	100.0

Five federally inspected and two independent producer-owned processing plants were responsible for processing the 1971 production of 32,906,000 pounds (14,957,000 kg.) of eviscerated broilers.

Table 3.2 shows the market share of each of the five federally inspected processors according to Hurnanen and as it was in 1971.

TABLE 3.2

CONCENTRATION IN PROCESSING

	1968 %	1971 %
Firm A	37	41.1
Firm B	44	34.8
Firm C-F	16	19.4
Firm E	3	2.7

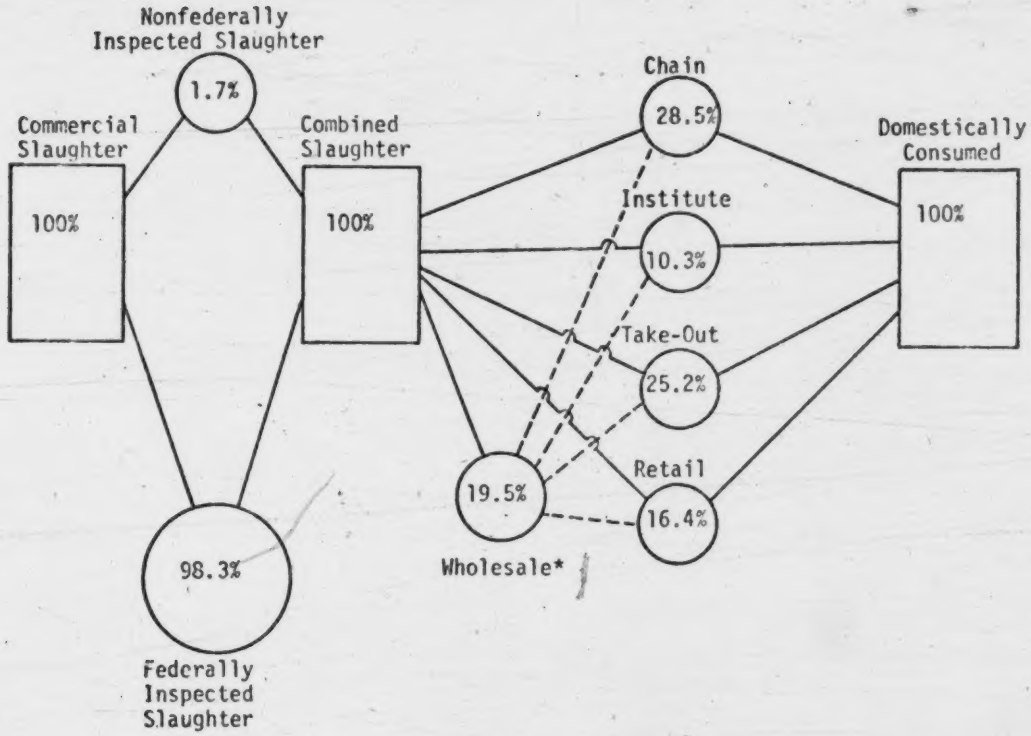
Source: Roy R. Hurnanen, "Vertical Integration and Concentration in the Alberta Broiler Industry" (Unpublished M.Sc. thesis, Department of Agricultural Economics and Rural Sociology, University of Alberta, Edmonton, 1970).

During the invoice study period 81 percent of the total sales were sold to retail outlets by the processors. The remaining 19 percent passed through one of eleven wholesalers on its way from the processor to final sale through a retail outlet. Figure 3.1 shows the distribution of sales through retail outlets in Alberta during the 1968-70 study period. The retail outlets were further broken down into: (1) chain stores -- Safeways, Loblaws, Woodwards, etc.; (2) take-out restaurants -- Kentucky Fried Chicken outlets, A & W, etc.; (3) institutions -- universities, hospitals, airlines, restaurants, etc.; (4) retail stores -- corner grocery stores, meat markets, etc.

Take-out restaurant and chain sales are the primary outlets for broiler chicken sales. While sales through chain stores are in a variety of forms and mainly frozen,

FIGURE 3.1

MAJOR MARKET CHANNELS FOR READY-TO-COOK BROILERS IN ALBERTA, 1968-70



*Available statistical data does not permit allocation of sales by wholesalers to their final destination.

take-out sales are entirely of a nine-piece cut variety and are fresh.

Figure 3.2 shows the corresponding marketing channels for broilers in the United States during the study period. The much larger volume of sales through institutional and take-out outlets in Alberta as compared to the United States is of major importance to the industry in deciding on effective promotional efforts and to producers in determining the size and quality of bird required. Also, the larger volume of federally inspected birds slaughtered in Alberta lends added assurance of a quality product reaching Alberta consumers.

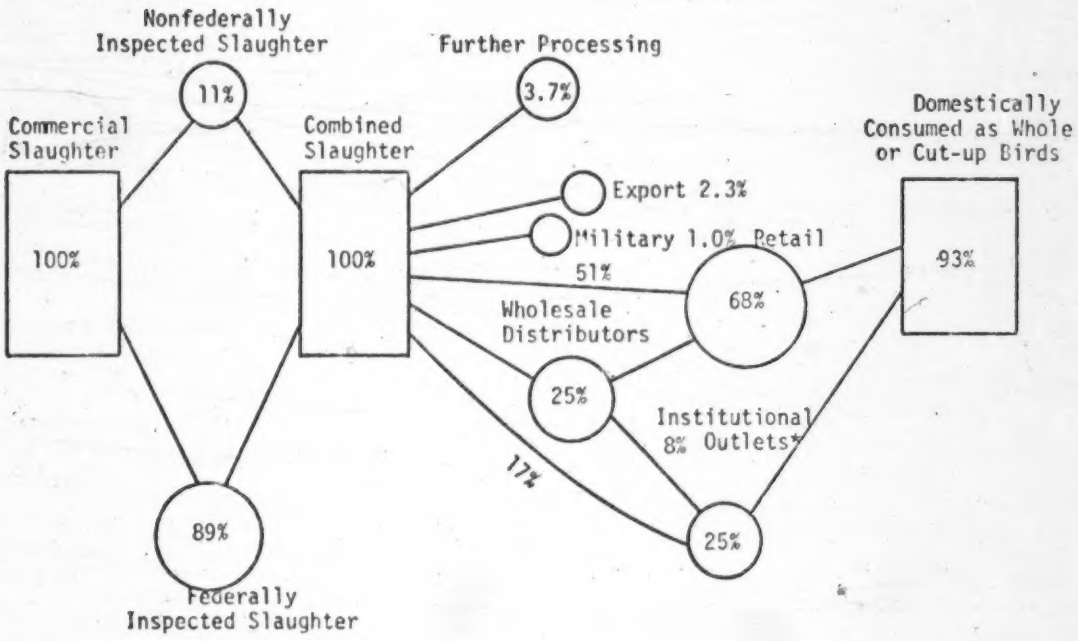
Geographic Market Area

Alberta broilers are not only sold in Alberta but are exported to other provinces. The southeastern portion of British Columbia and an area in Saskatchewan along the Alberta - Saskatchewan border regularly comprise a part of the Alberta market area. Figure 3.3 shows the geographic breakdown of sales by Alberta processors during the sales invoice study period.

The fact that 12 percent of Alberta's sales were to areas in British Columbia makes it important to Alberta producers that every effort be made to maintain the free uninhibited movement of product between provinces and that

FIGURE 3.2

MAJOR MARKETING CHANNELS FOR READY-TO-COOK BROILERS
IN THE UNITED STATES, 1969

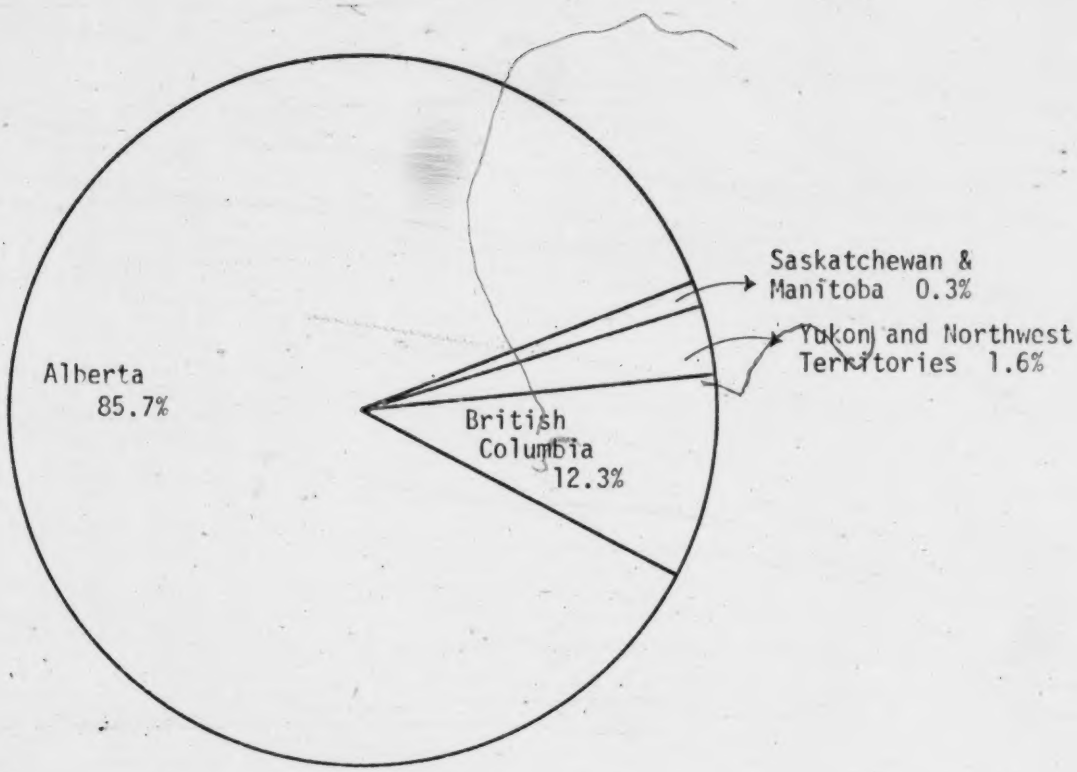


* Includes fast-food outlets, restaurants, schools, and other institutions.

SOURCE: B.W. Marion and H.B. Arthur, Dynamic Factors in Vertical Commodity Systems A Case Study of the Broiler System. (Wooster, Ohio: Ohio Agricultural Research and Development Center; Bulletin 1065, November 1973), p. 13.

FIGURE 3.3

GEOGRAPHIC MARKET AREA FOR ALBERTA BROILERS, 1968-70



any attempts at market allocation by a national Board be based on economic market areas rather than provincial boundaries.

The Alberta Broiler Growers' Marketing Board

The Alberta Broiler Growers' Marketing Board was established on January 13, 1966 through passage of the Alberta Broiler Growers' Marketing Plan 1965 under provisions of the Marketing of Agricultural Products Act. The purpose of the plan was:

(a) To maintain a fair stabilized price for the regulated product;

(b) To develop and maintain the orderly marketing of the regulated product;

(c) To maintain uniform high quality of regulated product for the market;

(d) To maintain adequate advertising and promotion of the regulated product;

(e) To ensure a continuous year-round supply of the regulated product for the trade and consumer market; and

(f) To work with marketing boards having similar

objectives in other provinces in Canada.[1]

Board Administration

The Alberta Broiler Growers' Marketing Board shares a joint administration with the Alberta Turkey Growers' Marketing Board. The joint administration has a staff of four -- the Secretary-Manager of both boards, a home economist, and two secretaries. The Board, through its office staff, plays an important regulatory or policing function by keeping records of all growers' placements and marketings of the regulated product to ensure that one individual does not exceed his allottment to the detriment of others.

The Board's operations are financed by means of an assessment of 0.2¢ per pound liveweight of product marketed. Figure 3.4 shows a breakdown of the Board's 1972 operating budget of approximately $77,000.

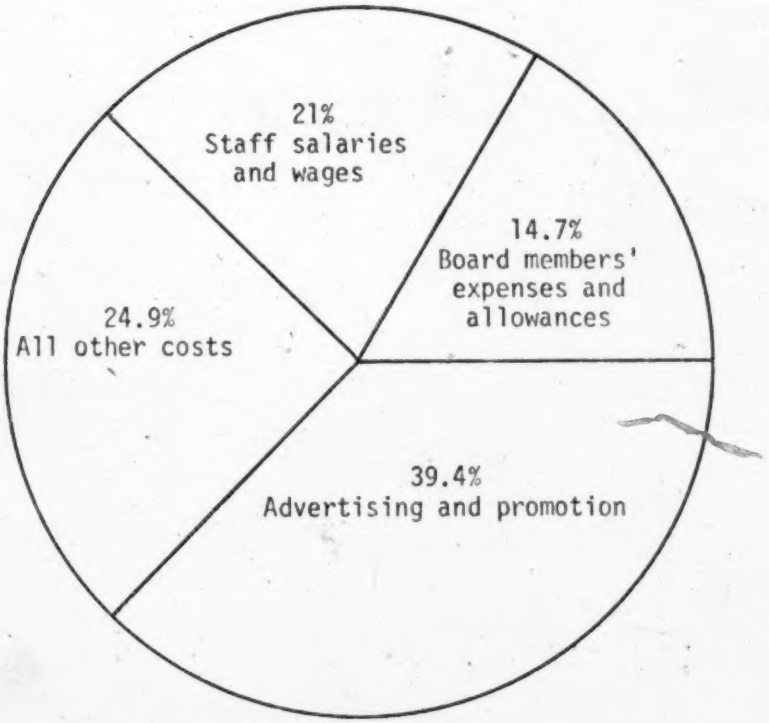
The Board is assisted in its long range planning by an Industry Advisory Committee which acts as a liaison between the Board and other segments of the Alberta broiler industry. The Committee consists of members nominated by the following organizations: one from the Alberta Hatchery Association, one from the Hatching Egg Producers'

---

[1] The Marketing of Agricultural Products Act, "Alberta Broiler Growers' Marketing Plan 1965" Established, Alberta Regulation 17/66, January 13, 1966. (Extract from The Alberta Gazette, Jan. 31, 1966.)

FIGURE 3.4

BREAKDOWN OF BOARD
ADMINISTRATION COSTS, 1972



AUG. 1972

SOURCE: Alberta Broiler Growers' Marketing Board, Six Years of Progress: Annual Report. (Edmonton: Alberta Broiler Growers' Marketing Board, 1972).

Association, one from the Canadian Feed Manufacturers' Association, Alberta Division, two from the Alberta Egg and Poultry Association, and three from the Alberta Broiler Growers' Association. The Industry Advisory Committee usually meets four times a year mainly to review market conditions and present the Board with a planning paper designed to assist the Board in its decision on future quota allocations and production levels. The Board also polls the Committee members for their opinions whenever a change in the price paid to producers is deemed advisable.

Conduct--Roles of the Board

Supply Management

The Board attempts to develop and maintain the orderly marketing of the product along with a fair and stabilized price by practising supply management. Registered producers are issued a quota permitting them to use a specified number of square feet of facilities for broiler production. The total amount of quota issued at any one time is based on equating supply with projected demand. Supply is based on an average marketing of one bird per square foot of production facilities per replacement cyle with replacements occurring every seventy days. Producers are considered to be operating at 100 percent capacity when they market one bird per square foot of the quota which they have been

issued. Production levels are adjusted by the Board to between 85 percent and 120 percent of capacity throughout the year in order to balance supply with the seasonal fluctuations in demand. The Board may also issue special permits for temporary production during periods of peak demand.

Quota Allocation

New quota is issued by the Board when it feels there is sufficient growth in demand to warrant the construction of increased production facilities. Who shall receive the new quota? The Board allocates new quota according to a set of priorities (See Appendix A) which have been approved by the Agricultural Products Marketing Council. It should be noted that quota is the property of the Board and, as such, does not have an explicit price attached to it. A producer is free to sell his facilities to whoever he wishes. However, upon sale of the facilities, the quota reverts back to the Board and it is at the Board's discretion whether or not the quota is transferred to the new owner.

Product Pricing

The Board sets the price to be paid by the processor to the producer for his product. The price set by the Board is on a liveweight basis f.o.b. the processing plant.

Adjustments in the price received by producers are made by the Board as warranted by conditions such as inventories, prices prevailing across Canada, prices of competing meat products, and the producers' cost of production. The ability of product to flow freely from other parts of Canada into Alberta insures that the Board is not able to inflate prices beyond those prevailing in other parts of Canada plus the cost of transporting product into Alberta.

Product Promotion

During 1972, the Board carried out an advertising campaign on radio and in the newspapers which accounted for 39.4 percent of the Boards' $76,900 budget. The radio campaign, "Check-out with Chicken," used one minute commercials aired weekday mornings on radio stations in Edmonton and Calgary, and was supplemented by colorfully dressed young men distributing balloons and Cooking Alberta's Chicken cookbooks in supermarkets. "Try a little tenderness" was the theme of the weekly newspaper advertisements which advocated trying a different chicken recipe each week along with an offer of a free recipe book in exchange for a favorite recipe. Displays were presented at the Calgary Poultry Show and at the 1972 Klondike Days in Edmonton. As well, the Board and the Alberta Department of Agriculture co-hosted an evening for retailers and wholesalers in order to acquaint them with the many ways

chicken could be prepared and to learn of any problems these people had in selling the product.

Summary

One integrated firm plays a dominant role in the marketing of Alberta broilers from the hatching of chicks for placement to the processing of product for shipment to the final consumer. The Alberta Broiler Growers' Marketing Board serves as a facilitating organization for the coordination of the production of broilers by the 115 registered producers within the province. The coordination of production efforts by the Board by means of forecasting future sales and the allocation of quota permits the Board to interject an added degree of stability into the industry and to prevent the one dominant firm from overtaking the entire industry. The Board also acts as a liaison between all segments of the industry. The success of the Board in coordinating production in order to increase price stability is dependent upon the Board's knowledge of the seasonality of demand for the product and the Board's ability to forecast future sales of product taking into account the seasonality of demand and adjusting production accordingly.

CHAPTER IV

COMPOSITION AND SEASONALITY OF ALBERTA BROILER SALES

Many food products do not enjoy a steady demand throughout the year even though they may be available in ample supply during the year. Variations in demand which are not accompanied by compensating variations in supply may result in marked price instability and accompanying long reaching effects on the industry. While knowledge of these variations enables producers to adjust their production (supply) schedules, it may also assist processors in planning their operations and assist retailers in planning advertising and other promotional campaigns aimed at counteracting the seasonal decline in demand. Success in leveling out demand would lead to price stability and increased operational efficiency through more efficient use of production facilities.

Studies in the United States by Rogers and Conley[1] and Buck[2] indicate that a seasonal variation in demand for broilers does exist. Rogers and Conley state that domestic

---

[1] George B. Rogers and Frank M. Conley, "Marketing Poultry and Eggs," Agricultural Markets in Change, Report No. 95 (Washingtion: U.S. Department of Agriculture, July, 1966), pp. 329-368.

[2] John T. Buck, Marketing Poultry Meats in Retail Food Stores in Non-Metropolitan Areas in Virginia, Research Bulletin 488 (Blacksburg, Virginia: Virginia Polytechnic Institute, April, 1958).

consumption in the United States is highest in May and June and lowest in December and January. Buck's study of retail food stores in non-metropolitan areas in Virginia showed that 40 percent of the stores selling fresh frying chicken reported greatest sales during the summer months. An earlier study by Stanton[1] was inconclusive as to whether different price elasticities for broilers in the summer and winter existed. Rogers and Conley[2] state that 19 percent of the volume of broilers slaughtered under Federal inspection was cut up at processing plants and at least that much was probably cut up by subsequent handlers. However, no attempt was made at determining whether the seasonal pattern for cut-up broilers holds for whole broilers. Pauls and Harrington,[3] in a study of consumer preferences for jumbo young chicken in the State of Washington, found that 40 percent of the respondents who had purchased jumbo young chicken preferred to buy them as parts, 32 percent preferred cut-up, and 28 percent, whole.

Is there a similar seasonal demand for Alberta broiler chickens? In what form do people purchase Alberta broilers and from what outlets do they purchase them? Does

---

[1] B.F. Stanton, "Seasonal Demand for Beef, Pork and Broilers," Agricultural Economics Research, Vol. 13, No. 1 (January, 1961), 1-14.
[2] Rogers and Conley, "Marketing Poultry and Eggs," p. 338.
[3] Daniel E. Pauls and Albert H. Harrington, Merchandising Poultry: Jumbo Young Chicken, Circular 454 (Pullman, Washington: Washington State University, 1965).

seasonality affect the various forms of chicken sales in the same manner as it affects total chicken sales? Does the volume of chicken sold through the various outlets change with the seasons? These and other questions were considered in analyzing the sales invoice data collected for this study.

Statistical Analysis

An analysis of variance of the data resulting from the sales invoice sampling was carried out in order to determine the sources of observed variation in Alberta broiler sales. The analysis of variance assumed a completely randomized factorial design. Six factors or possible sources of variation were identified. Table 4.1 shows the six factors and the corresponding number of treatment levels associated with each factor. The twelve forms of chicken originally identified in the sales invoice sampling were aggregated into four forms for the analysis of variance. The nine categories of wings, breasts, legs, thighs, legs and thighs, backs and necks, edible offal, unclassified, and splits (halved and quartered) were summed to form the new category of segments. The five provinces originally identified as outlets for Alberta broilers were also aggregated into sales within Alberta and those outside Alberta or exports. The aggregation was performed to increase statistical significance.

TABLE 4.1

SOURCES OF VARIATION IN
ALBERTA BROILER SALES

Factor	Levels
Weeks	13
Quarters	4
Years	2
Outlets	5
Forms	4
Provinces	2

The significant sources of variation in broiler sales and the significant interactions between these sources are presented by way of tables in this chapter. The statistical or sample unit within these tables is the average daily sales of broiler chickens in the particular form or through the particular outlet for the season or outlet relevant to the particular table in question. Total figures for each level of the factor involved in the interaction and percents of the relevant row and column sums for each level of the factors are presented. A grand total for each interaction is also shown. As well, an index to show the movement of a factor level or cell of each table relative to the overall movement of the interaction is presented. The index was constructed by determining the percent the row or column percent of each cell was of the corresponding total percentage. Such an index permits, for example, the determination of shifts between the four forms of chicken sales during the four seasons while the level of overall sales is also changing.

Seasonality of Sales

Table 4.2 shows the seasonal indices of broiler sales derived from the sales invoice data for the September, 1969 to August, 1970 period and the corresponding seasonal indices derived from sales figures for 1971 as reported in the Board's Weekly Report to Processors. As can be seen overall broiler sales are highest in the spring and summer and lowest in the fall and winter.

TABLE 4.2

SEASONAL INDICES OF ALBERTA BROILER SALES

Season	Index	
	Sales Invoice Data	Board Sales Data
Winter	91.99	96.68
Spring	102.64	102.24
Summer	108.46	110.60
Fall	96.99	90.47

Table 4.3 shows the effects of seasonality on the sales of the various forms of broilers. The largest shift in the composition of sales occurs during the spring. Cut-up and segment sales show marked increases at the expense of nine-piece cut-up sales. The relative decline in nine-piece cut sales comes at a time when overall chicken sales are increasing. Whole chicken enjoys a seasonal demand most consistent with the overall seasonal demand for broilers and accounts for almost one half of all chicken sales. Nine-

TABLE 4.3

DISTRIBUTION OF AVERAGE DAILY BROILER SALES BY SEASON AND FORM SOLD

Season	Form Sold					Seasonal Index			
	Whole	Cut-Up	9-Pce	Segments	Total	Whole	Cut-Up	9-Pce	Segments
WINTER									
(quarter 1)	2506.3	621.6	1507.1	612.5	5247.4				
% of Row Total	47.8	11.8	28.7	11.7	100.0	99.8	106.3	99.7	95.9
% of Col Total	20.7	22.2	20.7	19.8	20.8				
SPRING									
(quarter 2)	3592.9	900.9	1881.0	971.7	7346.5				
% of Row Total	48.9	12.3	25.6	13.2	100.0	102.1	110.8	88.9	108.2
% of Col Total	29.7	32.2	25.8	31.4	29.1				
SUMMER									
(quarter 3)	3662.2	771.1	2342.7	910.4	7686.4				
% of Row Total	47.6	10.0	30.5	11.8	100.0	99.4	90.1	105.9	96.7
% of Col Total	30.2	27.5	32.2	29.4	30.4				
FALL									
(quarter 4)	2347.8	507.7	1553.7	597.9	5007.1				
% of Row Total	46.9	10.1	31.0	11.9	100.0	97.9	91.0	107.6	97.5
% of Col Total	19.4	18.1	21.3	19.3	19.8				
TOTAL	12109.2	2801.2	7284.4	3092.5	25287.4				
% of Row Total	47.9	11.1	28.8	12.2	100.0				
% of Col Total	100.0	100.0	100.0	100.0	100.0				

piece cut-up holds the second largest share of the market at an annual average of 28.8 percent. Cut-up chicken and segments share the remainder of the market with 11.1 and 12.2 percent, respectively.

Sales Outlets and Seasonality

Sales by chain stores and take-out restaurants, collectively, account for over half of the sales to the final consumer. Table 4.4 shows that sales through the various outlets is also affected by seasonality. Sales through take-out restaurants and institutions are lowest in the spring while sales through retail and chain stores relative to total sales are lowest during the summer. Sales through wholesalers show a marked seasonal pattern with the greatest relative sales during the spring and summer.

Composition of Sales by Various Outlets

Table 4.5 illustrates the distribution of the four forms of chicken sold by the five outlets. The most noticeable feature is the predominance of nine-piece cut-up sales by take-out restaurants. This is to be expected as the nine-piece cut is a special form designed for the drive-inn restaurant trade and is sold almost entirely as fresh ice-packed chicken as opposed to mainly frozen for the remainder of sales. Wholesalers are of major importance in

TABLE 4.4

DISTRIBUTION OF AVERAGE DAILY BROILER SALES BY SEASON AND OUTLET

Season	Outlet						Seasonal Index				
	Chain Stores	Insti-tutions	Take-Out Restau-rant	Whole-Sale	Retail Stores	Total	Chain Stores	Insti-tutions	Take-Out Restau-rant	Whole-sale	Retail Stores
WINTER (quarter 1)	1732.0	646.2	1720.6	830.6	1630.0	6559.2					
% of Row Total	26.4	9.9	26.2	12.7	24.8	100.0					
% of Col Total	21.2	19.9	21.4	14.0	26.3	20.8	101.9	97.1	103.1	67.6	126.5
SPRING (quarter 2)	2450.0	725.5	1971.8	2293.2	1742.5	9183.0					
% of Row Total	26.7	7.9	21.5	25.0	19.0	100.0					
% of Col Total	29.9	22.4	24.5	38.6	28.1	29.1	103.1	77.5	84.6	133.0	96.9
SUMMER (quarter 3)	2232.6	966.6	2598.2	2178.2	1632.4	9608.0					
% of Row Total	23.2	10.1	27.0	22.7	17.0	100.0					
% of Col Total	27.3	29.8	32.3	36.6	26.3	30.4	89.6	99.0	106.3	120.7	86.7
FALL (quarter 4)	1771.0	900.9	1751.6	645.1	1190.3	6259.0					
% of Row Total	28.3	14.4	28.0	10.3	19.0	100.0					
% of Col Total	21.6	27.8	21.8	10.8	19.2	19.8	109.3	141.2	110.2	54.8	96.9
TOTAL	8185.6	3239.1	8042.0	5947.2	6195.2	31609.5					
% of Row Total	25.9	10.2	25.4	18.8	19.6	100.0					
% of Col Total	100.0	100.0	100.0	100.0	100.0	100.0					

TABLE 4.5

DISTRIBUTION OF AVERAGE DAILY BROILER SALES BY OUTLET AND FORM SOLD

Outlet	Form Sold					Index			
	Whole	Cut-Up	9-Pce	Segments	Total	Whole	Cut-Up	9-Pce	Segments
CHAIN STORES	4751.6	1443.7	64.2	1926.1	8185.6				
% of Row Total	58.0	17.6	0.8	23.5	100.0	121.2	159.0	2.7	192.6
% of Col Total	31.4	41.2	0.7	49.9	25.9				
INSTITUTIONS	1810.4	143.1	777.1	508.6	3239.1				
% of Row Total	55.9	4.4	24.0	15.7	100.0	117.6	40.1	83.3	129.4
% of Col Total	12.0	4.1	8.5	13.2	10.2				
TAKE-OUT RESTAURANTS	160.5	114.2	7713.6	53.9	8042.0				
% of Row Total	2.0	1.4	95.9	0.7	100.0	4.3	12.9	333.4	5.5
% of Col Total	1.1	3.3	84.7	1.4	25.4				
WHOLESALE	3612.3	1165.0	360.1	809.7	5947.2				
% of Row Total	60.7	19.6	6.1	13.6	100.0	127.1	177.1	21.2	111.7
% of Col Total	23.9	33.3	4.0	21.0	18.8				
RETAIL STORES	4801.8	635.6	190.6	567.2	6195.2				
% of Row Total	77.5	10.2	3.0	9.1	100.0	161.7	92.8	10.7	75.0
% of Col Total	31.7	18.2	2.1	14.7	19.6				
TOTAL	15136.5	3501.5	9105.5	3865.5	31610.0				
% of Row Total	47.9	11.1	28.8	12.2	100.0				
% of Col Total	100.0	100.0	100.0	100.0	100.0				

the sales of cut-up broilers. Another noticeable feature is that institutions either purchase whole birds and cut them up themselves or buy individual segments. The relative majority of sales through retail stores are whole birds.

Seasonality, Form and Outlet of Export Sales

It has been shown that differences in the form of chicken sold and the outlets through with it is sold occur during the year. Attention is now turned to sales outside of Alberta to determine if similar differences in consumption patterns exist between areas within Alberta and those areas outside of Alberta where Alberta broilers are sold. Table 4.6 compares the form of chicken sold in the two areas; while, Tables 4.7 and 4.8 compare the outlets through with the sales are made and the time of year during which the sales occur. Cut-up chicken, while not constituting the largest volume of exports, holds a relatively larger share of the broiler sales outside Alberta than it does within Alberta. Retail stores and take-out restaurants are of greater importance in export sales then they are in sales within Alberta. Only 10.3 percent of the sales outside Alberta are made to chain stores while 28.5 percent of the sales in Alberta are made directly to chain stores. Table 4.8 shows that sales outside Alberta constitute a smaller share of the total market during the summer and fall than they do during the rest of the year.

TABLE 4.6

DISTRIBUTION OF AVERAGE DAILY BROILER SALES BY DESTINATION AND FORM SOLD

Destination	Form Sold					Index			
	Whole	Cut-Up	9-Pce	Segments	Total	Whole	Cut-Up	9-Pce	Segments
ALBERTA	5214.2	1168.1	3109.5	1345.2	10837.2				
% of Row Total	48.1	10.8	28.7	12.4	100.0	100.5	97.3	99.6	101.5
% of Col Total	86.1	83.4	85.4	87.0	85.7				
EXPORTS	840.4	232.5	532.7	201.1	1806.6				
% of Row Total	46.5	12.9	29.5	11.1	100.0	97.2	116.1	102.1	90.9
% of Col Total	13.9	16.6	14.6	13.0	14.3				
TOTAL	6054.6	1400.6	3642.2	1546.2	12644.0				
% of Row Total	47.8	11.0	28.8	12.2	100.0				
% of Col Total	100.0	100.0	100.0	100.0	100.0				

TABLE 4.7

DISTRIBUTION OF AVERAGE DAILY BROILERS SALES BY PROVINCE AND OUTLET

Destination	Chain Stores	Insti-tutions	Take-Out Restau-rants	Whole-sale	Retail Stores	Total	Chain Stores	Insti-tutions	Take-Out Restau-rants	Whole-sale	Retail Store
ALBERTA	3859.4	1404.5	3408.7	2660.2	2213.5	13546.5					
% of Row Total	28.5	10.4	25.2	19.6	16.3	100.0	110.0	101.2	98.9	104.4	83.4
% of Col Total	94.3	86.7	84.8	89.5	71.5	85.7					
EXPORT	233.4	215.1	612.4	313.4	884.1	2258.3					
% of Row Total	10.3	9.5	27.1	13.9	39.1	100.0	39.9	93.0	106.3	73.4	199.3
% of Col Total	5.7	13.3	15.2	10.5	28.5	14.3					
TOTAL	4092.8	1619.6	4021.0	2973.6	3097.6	15805.0					
% of Row Total	25.9	10.2	25.4	18.8	19.6	100.0					
% of Col Total	100.0	100.0	100.0	100.0	100.0	100.0					

TABLE 4.8

DISTRIBUTION OF AVERAGE DAILY BROILER SALES BY DESTINATION AND SEASON

Destination	Season					Seasonal Index			
	1 Winter	2 Spring	3 Summer	4 Fall	Total	1 Winter	2 Spring	3 Summer	4 Fall
ALBERTA	2182.8	3106.5	3348.6	2199.2	10837.1				
% of Row Total	20.1	28.7	30.9	20.3	100.0	97.1	98.7	101.6	102.5
% of Col Total	83.2	84.6	87.1	87.8	85.7				
EXPORT	441.0	566.8	494.6	304.3	1806.6				
% of Row Total	24.4	31.4	27.4	16.8	100.0	117.5	107.7	90.2	85.3
% of Col Total	16.8	15.4	12.9	12.2	14.3				
TOTAL	2623.8	3673.3	3843.2	2503.5	12643.7				
% of Row Total	20.8	29.1	30.4	19.8	100.0				
% of Col Total	100.0	100.0	100.0	100.0	100.0				

The smaller export sales during the summer is of significnace because the summer is the period of greatest absolute sales.

Summary

Broiler sales are greatest in the summer and lowest in the winter. Broiler sales consist of 47.9 percent whole birds, 11.1 percent cut-up birds, 28.8 percent nine-piece cut-up birds, and 12.2 percent segmented birds. Sales of nine-piece cut-up chicken show the greatest proportionate increase during the summer; while, segments show the greatest decrease during the winter. Chain stores and take-out restaurants account for 25.9 and 25.4 percent of the sales respectively. Wholesale outlets show the greatest fluctuations in sales during the year. Changes in the form of chicken sold through the various outlets occur during the year. Approximately 85.7 percent of the broilers processed by Alberta processors are sold in Alberta, the remaining 14.3 percent are sold in areas outside Alberta, mostly British Columbia and Yukon and the Northwest Territories. Retail stores are the major outlet for sales outside the province. Exports are the greatest in the spring and the lowest in the fall.

CHAPTER V

PLANNED PRODUCTION AND ORDERLY MARKETING

Prices have several fundamental roles to play in today's economy: (1) to allocate resources among alternative uses; (2) to allocate goods and services among alternative uses; (3) to balance forces of supply and demand; and (4) to produce and allocate income payments. However, prices seem unable to fulfill their complete and independent role of equating supply and demand in the Alberta broiler industry as the price to be paid to producers is set by the Board.

Prior to the Board's establishment the high concentration which existed in the industry often resulted in over-reaction to price signals received within the marketing chain. The short time (thirteen weeks) necessary to react to a change in price and either expand or cutback production caused fluctuations in supply. If the decision to expand or contract production was made by a major producer because of his size, the resulting change in supply was of a major proportion, starting another round of adjustments. Wide swings in price and the subsequent supply of broilers led to marked price instability in the market place causing the exit of small farmers who were unable to

survive periods of low prices. Work by Rizvi[1] shows that price fluctuations prior to the Board's establishment were of greater magnitude than price fluctuations since the Board's establishment. When it was established the Board was charged with stabilizing prices and supply and was given the power to regulate prices and production. With prices being set by the Board it was also necessary for the Board to assume the balancing of supply and demand, one of the major roles of prices. Therefore, it was necessary for the Board to plan production to meet expected demand. This required a forecast of future sales of broiler chicken.

The Board's success in stabilizing prices and production is highly dependent upon its ability to forecast sales sufficiently in advance to allow for adjustments in production. The lead time necessary for hatching egg producers to expand output, for hatcheries to make more chicks available for placement, and for producers to produce a marketable broiler chicken requires that decisions on expansion or contraction of production be made a minimum of thirteen weeks in advance of the expected shift in demand. In cases where current production facilities are felt to be inadequate to meet the expected demand and where

---

[1] Saiyed M.H. Rizvi, "Marketing Boards in Canada--An Evaluation of Their Quota Policies With Special Reference to to the Broiler Chicken Industry" (Unpublished Ph.D. thesis, Department of Agricultural Economics and Rural Sociology, University of Alberta, Edmonton, 1974).

construction of new facilities is deemed necessary, a decision a year in advance is desirable. One year lead time is necessary to permit the allocation of quota and for farmers to plan and complete construction in time for birds to be marketed when required.

The accuracy of the Board's forecasts has a great impact on the operational and exchange efficiency which exists within the industry. An error in short-run projections may result either in excess costs of storing inventories because of over-production or in the temporary loss of potential markets because of a shortage of supply which is filled by imports. An error in long-run forecasts may result in a lack of production facilities or excess capacity. A shortage of production facilities will result in a shortage of supply and probable loss of market area as other areas expand their production and service to what was previously part of Alberta's market area. Excess capacity results in a decrease in operational efficiency because all producers must then operate at less than optimal levels in order to avoid excess supplies until demand expands sufficiently to meet the increased potential supply. Improved methods of forecasting demand may result in improved market efficiency.

Sales Forecasting

While there are many levels and degrees of complexity at which one might approach the problem of forecasting, there are only three basic techniques used for forecasting the future:[1]

1. Persistence
2. Empirical regularities in time
   a) Trend
   b) Periodicities (seasonal, etc.)
3. The forces at work
   a) Correlation

Persistence

Persistence, the simplest technique, assumes that things will not change in the near future. While this is not the most successful method, it is probably the one most businessmen use for making short-term business decisions. However, with the lengthening of the term over which the forecast is applied, things are less likely to remain constant and the chance of error in the forecast becomes greater.

Time Series Analysis

Analysis of the past history of relevant data for the detection of observable and reasonably dependable regularities, and projection of these regularities into the

---

[1] Samuel B. Richmond, Statistical Analysis (New York, New York: The Ronald Press Co., 1964), p. 340.

future constitutes a very widely used general forecasting technique. It is also the technique practised by the Board. In this connection, there are two distinct kinds of empirical regularities which may be analyzed and projected. Some regularities result in long-term growth (or contraction) according to some easily described function such as a constant level or constant rate of growth. These regularities are usually some long-term, slow-acting factor such as population growth, migration or the growth of an industry because of increased consumer acceptance. Such regular long-term change is called secular trend. Certain other regularly recurring forces cause periodic fluctuations to occur with a high degree of regularity and dependability. Among the most important of these are the astronomical regularities resulting in the annual variations in the weather and the daily variations of temperature and sunlight. Added to these, and effectively as regular and dependable, are the periodic variations resulting from religion, culture and custom.[1]

Before proceeding with a specfic application, a further explanation of time series is in order. A time series is a set of observations on the same variable such that the observations differ among themselves, not only because of sampling variaticns and other chance or random effects, but

---

[1] Samuel B. Richmond, Statistical Analysis, p. 342.

also because the true value of the variable being measured (the parameter) is changing over time. Thus such chance or sampling variation as there may be in the mass of observations is supplemented by possible secular trend effects, periodic variations and cyclical effects, if the phenomenon is one that is influenced by business cycles.

Cyclical effects are not treated as periodic effects because the business cycle is not a periodic phenomenon. Business cycles are recursive but not periodic and, therefore, are not susceptible to analysis by the techniques which have been developed for the treatment of seasonal variation and other periodic fluctuations.[1]

The purely mechanical forecasting techniques, based on analysis of trend and seasonal factors, involve the projection of these two systematic or regular sources of change in the variable. In other words, trend is projected into the future, and monthly or quarterly forecasts are made by adjusting for the empirically determined seasonal effects. Such forecasts are in error to the extent that cyclical and residual forces influence the course of the variable.

Seasonal indexes may be calculated by either using a four quarter-centered moving average or by calculating

---

[1] Ibid., p. 344,419.

ratio-to-trend indexes. The seasonal indexes are then used to deseasonalize the data and a trend is calculated using least squares estimation. The seasonal indexes are once again applied tc the resulting trend line to yield a seasonal forecast.

Application of Time Series Analysis to Broiler Sales

Table 5.1 compares the ratio-to-trend and four quarter-centered moving average methods for forecasting 1971 demand for Alberta broilers to the actual events. It should be noted that while 1967 - 1970 data were used for the ratio-to-trend calculations, 1966 data were added for the four quarter moving average calculations as one year is lost in calculating the seasonal indexes and sixteen observations were deemed necessary for a reliable trend line.

TABLE 5.1

COMPARISON OF SEASONAL INDEX FORECASTS FOR 1971

(Sales - 1,000 lbs.)

	Quarter				1971
	1	2	3	4	Total
Actual Sales	8314.0	8792.0	9511.0	7780.0	34397.0
Ratio-to-Trend Forecast	7990.0	9481.3	9442.7	8067.6	34981.6
% Error	-3.9	7.8	-0.7	3.7	1.7
4-Quarter Moving Average Forecast	8205.4	9624.0	9553.8	7909.1	35292.3
% Error	-1.3	9.5	0.5	1.7	2.6

While both methods overestimated 1971 sales, the ratio-

to-trend method is to be preferred as it was the closest to the actual. Sales during 1971 also serve to emphasize the fact that the forecasts are based on the assumption that what has happened in the past will continue in the future. At the time 1971 sales forecasts were made there was no way of knowing that political moves would result in British Columbia closing its borders to Alberta product. The closure resulted in decreased sales during the second quarter of 1971.

Forces at Work and the Forecasting Model

The most rational approach to forecasting the future is to analyze the causative forces operating on the variable to be predicted, and to base the forecast on the relationships disclosed and on any anticipated changes in the forces and their operation. There are many specific techniques, mathematical and non-mathematical, that may be called into play in the analysis of forces at work, in the search for useable relationships, and in the quantification of these relationships. Here, once again, the most important tool is knowledge of the phenomena under study. There is no mathematical substitute for experience and mature judgement.

There are at least four determinants of individual

demand[1] or possible causes for the observed variation in broiler sales. The first is the price of the commodity under consideration. According to the law of demand, quantity demanded varies inversely with price. Another way of expressing this principle is to say that the demand curve is negatively sloped. Expressed in yet another way, changes in nominal price cause movements along a given demand function, the movements representing the opposite changes in the quantity demanded.

The remaining determinants establish the level or position of the entire demand curve. Money income is an important determinant. For almost all individuals and most commodities, the greater the money income the greater the demand. The third determinant of demand is taste. The tastes or preference patterns of most individuals change rapidly. An increase in the intensity of one's desire for a commodity naturally leads to an increase in his demand for the commodity. The opposite occurs of course, if a person's taste for a commodity lessens. Finally, the prices of related commodities condition the level of demand for the commodity in question. Using the demand function approach, two goods are said to be substitutes if an increase in the price of one leads to an increase in the consumption of the

---

[1] Paul A. Samuelson and Anthony Scott, Economics: An Introductory Analysis (Canadian Edition; Toronto: McGraw-Hill Co. Ltd., 1966), p. 463.

other. The opposite relationship holds for complementary goods. How does this apply to the demand for chicken?

It has already been shown that sales of broiler chickens and thus, people's tastes and preferences for broiler chicken, change during various seasons of the year. Work by Ladd and martin[1] suggests that as people's incomes increase, their consumption of chicken will decrease slightly. Ladd's study also suggests that pork and beef are substitutes for chicken.

The formulation of a forecasting model based on such information has two drawbacks. There is a shortage of data available to quantify population growth and incomes on a quarterly basis for Alberta. While yearly data are available, a quarterly forecast is desirable because of the unique ability among farm products of adjusting broiler production on thirteen weeks notice. The second drawback is that once the model is formulated, forecasts of the factors included in the model are necessary before making a forecast of the demand for broiler chickens. Such forecasts are beyond the time restraints placed on the Board's management.

A simplified model that permits a new forecast to be made each quarter by utilizing the demand for the previous

---

[1] George W. Ladd and James E. Martin, Application of Distributed Lag and Autocorrelated Error Models to Short-Run Demand Analysis, Research Bulletin 526 (Ames, Iowa: Iowa State University, 1964).

quarter is necessary. A linear time variable with zero mean may be used as a proxy for population and income growth assuming that both are increasing at a constant rate over the model period. Earlier data have shown the significance of the change in broiler sales with seasons of the year. Seasons of the year, however, are not quantified. Klein[1] was one of the first people to suggest the use of dummy variables as a means of quantifying seasons and shortening the time series analysis from annual to seasonal (quarterly). Four variables, each one representing a season, are added to the model. Each variable then takes on a value of one if the observation is for that season and zero if it is not. However, problems of indeterminateness in estimating such a model require that one variable be eliminated and that the other three take on values of zero when an observation represents the eliminated season.[2]

Such a model, when applied to forecasting 1971 broiler sales based on 1966 - 1970 sales, yields:

$Y = 6444 + 57.44X1 + 528.46X2 + 1579.98X3 + 1371.89X4$

$R^2 = 84.97$

where Y = quarterly broiler sales (,000 lbs.),

---

[1] L.R. Klein, Econometrics (Evanston, Illinois: Row, Peterson and Co., 1953), p. 314.

[2] For a further explanation see: B.B. Suits, "Use of Dummy Variables in Regression Analysis," Journal of Farm Economics, (Nov. 1963), or William G. Tomek, "Using Zero - One Variables with Time Series Data in Regression Equations," Journal of Farm Economics, Vol. 45. (1963), p. 814.

X1 = time variable (orgin, quarter 3, 1968),

X3 = second quarter dummy variable, and

X4 = third quarter dummy variable.

The model forecasts 1971 sales as being 34,770,570 pounds.

Table 5.2 shows the comparison between the ratio-to-trend forecast, the model using dummy variables for seasonality estimated using four years of data, and the same model estimated using five years of sales as a data base on which to base the forecast. The model using five years of data predicted 1971 sales with an error of 1.08 percent.

TABLE 5.2

COMPARISON OF 1971 FORECASTS USING DUMMY VARIABLES
(Sales - 1,000 lbs.)

Forecast Method	Quarter 1	2	3	4	1971 Total
Actual Sales	8413.0	8792.0	9511.0	7780.0	34397.0
Ratio-to-Trend Forecast	7990.0	9481.3	9442.7	8067.6	34981.6
% Error	-3.9	3.8	-0.7	3.7	1.7
Model Forecast 4 Years Data	8286.5	9493.0	9313.8	8085.8	35179.0
% Error	-0.3	8.0	-2.1	3.9	2.3
Model Forecast 5 Years Data	8178.7	9345.1	9251.9	7994.9	34770.6

The model that has been developed and the resulting forecast are in terms of pounds of eviscerated chicken sold by Alberta processors each quarter. In order to determine quota allocations the sales forecast must be put in terms of

the number of birds that must be placed to yield an eviscerated production equivalent to the sales forecast. It is assumed that there will be a 5 percent death loss on placements resulting in 95 percent of the birds placed being marketed at an average eviscerated weight of 2.9 pounds. The forecasting and production of supply is only one step in the marketing continuum. Once the farmer has delivered his birds to the processors it is up to the processors to see that the consumer receives the product in the form desired.

Supply Management and Market Information

There is a shortage of current accurate market information on brcilers in Canada and in Alberta in particular. The Canada Department of Agriculture, through the Markets Information Section and the Poultry Division, publishes the Poultry Market Review on a weekly basis. The Review includes information on poultry slaugher in registered stations and poultry prices at the producer and wholesale levels. However, with reference to broiler chickens, the Review is lacking in several areas. The Review fails to differentiate between broiler chickens and Cornish Game hens or between light and heavy roaster chickens. It lists only chicken under four pounds eviscerated weight (five pounds liveweight) and chicken over four pounds eviscerated weight. Statistics on weekly consumption of broilers and broiler inventories are not

presented in the Review. The lack of consumption and inventory figures limits the usefulness of the Review to the Board in planning future production and to the processors in making decisions on their day-to-day operations.

The Board compiles a weekly report which is distributed to licensed processors and wholesalers in Alberta. The Board's report contains statistics on weekly marketings, imports, exports, consumption and inventories. The inventories are broken down into stocks of backs and necks, cut-up, and whole product. A summary of poultry advertising appearing in the major Alberta daily newspapers on Wednesday evening is included each week. Estimates of expected marketings in future weeks based on the number of placements are also presented.

The Board's report is one week out of date by the time it is received and has a very limited circulation. The inventory breakdown is limited to backs and necks, cut-up and whole birds and does not provide any further information as to the composition of the cut-up inventory with respect to various segments. The report's usefulness to processors in planning their inventory control and in deciding whether to engage in further processing of product by cutting up birds for sale as segments is limited.

Inventory Control

Figure 5.1 shows the difference between weekly marketings of broilers in Alberta and weekly consumption during 1971 - 1972 while Figure 5.2 shows the weekly total inventory levels for the same period. The minimum weekly inventory during the period exceeds the maximum difference between marketings and consumption by pounds. The sale of broiler chicken at the retail level occurs under a number of trade names requiring processors to maintain an inventory of cut-up tray-pack chicken under various wrappers rather than merely an inventory of cut-up chicken. The private trade names increase the necessary level of inventory. On the other hand, it has been shown that 28.9 percent of sales are of a nine-piece cut variety almost all of which is sold fresh, requiring no inventory.

Board policy has been to maintain inventory levels in excess of 1.5 million pounds to discourage the importation of product from other provinces. However, the policy of high inventory levels has not been successful in preventing imports because the inventory has been of the wrong product mix or because of a lack of market information (a processor is unaware that another processor has the desired product).

Excess inventory levels result in increased storage costs which must either be borne by the producer in the form of a lower price for his product or by consumers in the form

FIGURE 5.1

WEEKLY DIFFERENCE BETWEEN MARKETINGS AND CONSUMPTION OF ALBERTA BROILERS, 1971-72

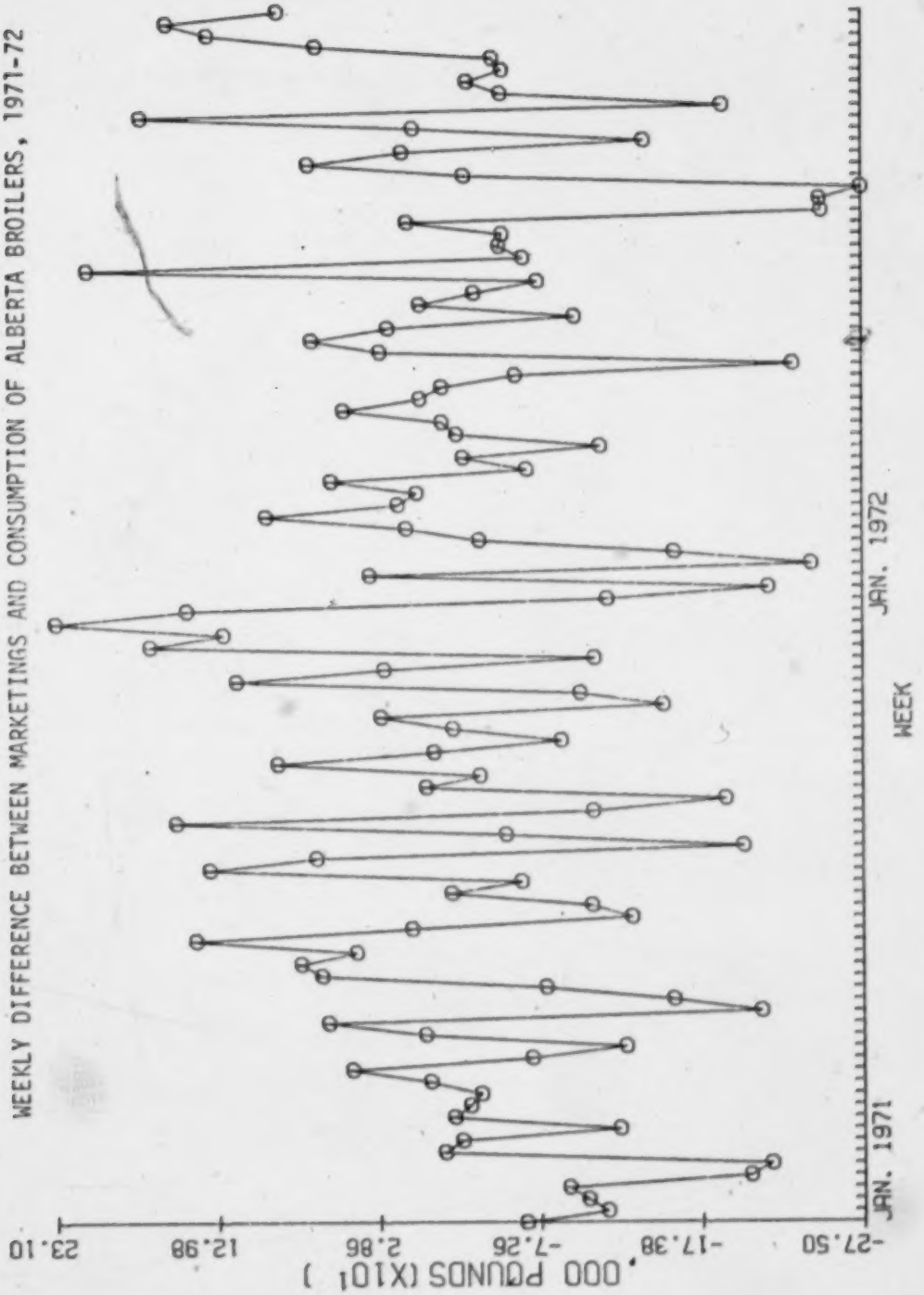
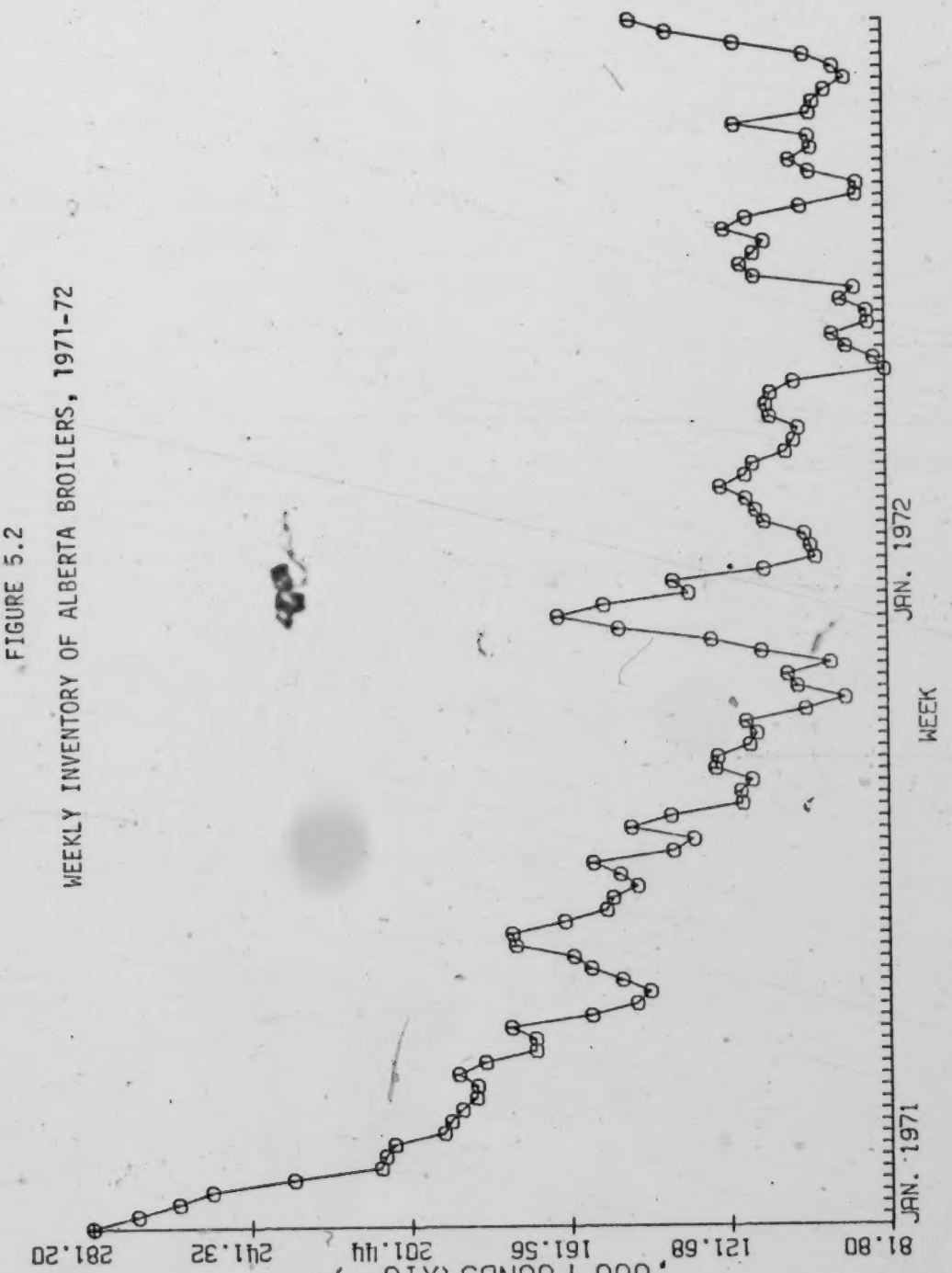


FIGURE 5.2

WEEKLY INVENTORY OF ALBERTA BROILERS, 1971-72



of a higher price for the product.

Interprovincial Movement of Broilers

The success of any province's efforts at stabilizing price and supply in the broiler industry through supply management is dependent upon its freedom to plan its production and shipments on a regional basis.

The Farm Products Marketing Agencies Act, Subsection 3, Section 23, Part II makes special provision for the regulation of interprovincial movement of the regulated product in the case of eggs or poultry. Such regulation, however, must be provided for in the marketing plan under which an agency is established.

The purpose of regulating interprovincial movement of broilers is to facilitate regional planning and shipments while providing a safeguard against provincial "dumping"[1] of excess product on other provinces. The following is a proposal for such a regulation and its implementation.

The proposed formula has been derived from the previous five year weighted average of the liveweight price (F.O.B. plant) in each province as reported in the Poultry Market

---

[1] "Dumping" refers to the selling of the regulated product in another province at a price which is below the cost of production plus the cost of transporting the product to that province.

Review by Canada Department of Agriculture, Markets Information Section and Poultry Division.[1] A five year period was chosen as a base for the formula in keeping with the Farm Products Marketing Agencies Act and the prescribed method of market sharing. The five year average price was chosen as an approximation of the cost of production plus a "fair" return to producers in each province. An arbitrary figure of 10 cents per pound was added to each of the computed average prices in order to cover the cost of processing.

The next step in the composition of the formula was to add the lowest published freight rates, based on the largest minimum carload lot shipment for fresh meat between any two given points. Thus the minimum price (Table 5.3) at which broilers may move between any two specified points was established. Movement at any price below the minimum would be classed as "dumping" and would come under agency scrutiny.

In order to safeguard the consumer and prevent any province from inflating its price to an artifically high level, a maximum price (Table 5.3) for sales within a

---

[1] 1971 prices were assigned a weighting factor of 5; 1970, a factor of 4; 1969, a factor of 3; 1968, a factor of 2 and 1967, a factor of 1. Starting with January 1, 1970 a factor of one half cent was added to the reported prices for Vancouver, Winnipeg, Toronto, and Halifax to bring these to comparable F.O.B. plant prices.

TABLE 5.3

PRICE* FOR INTERPROVINCIAL MOVEMENT OF BROILERS

From \ To	Vancouver	Edmonton	Regina	Winnipeg	Toronto	Montreal	Halifax
Vancouver	32.00	34.63	35.84	36.68	41.01	41.01	41.29
Edmonton	32.27	31.10	32.39	33.16	34.59	34.59	35.30
Regina	35.15	33.16	30.71	32.77	33.51	33.51	34.28
Winnipeg	35.71	31.31	30.66	30.00	32.24	32.24	33.06
Toronto	39.45	37.63	36.21	35.22	30.43	32.12	32.83
Montreal	37.32	35.51	34.09	33.10	30.18	28.31	30.22
Halifax	40.94	39.12	37.60	36.54	33.77	33.21	31.65
MAXIMUM SELLING PRICE FOR DUMPING TO APPLY							
Price*	23.50	23.00	22.50	21.25	22.25	20.50	23.50

* cents/pound F.O.B. plant live Canada No. 1 broilers.

province was also determined. The highest price during the previous five years in each province is said to be the maximum price. If the price within a province exceeds the listed price at any time, dumping restraints no longer apply. Any other province would be free to ship products into that province at any price it wished without fear of repercussions from the agency. The maximum price established is a liveweight price F.O.B. plant. The reason for choosing this method of expressing the price is so that it is common knowledge across Canada. The position of any province at any time may be quickly determined by consulting the Poultry Market Review. implementing such a proposal it would be necessary to come to an agreement on what freight rates were to be used. While the rates used in this proposal are rail rates, it would be necessary to at least consider truck rates between adjacent provinces. As well, published freight rates were used here, while in point of fact actual rates may differ somewhat. To be realistic it may be necessary to obtain the unpublished rates for use in the formula. The principal problem with the use of unpublished rates is that provinces would no longer have factual evidence with which to support their case and extended debates might result.

Concluding Comments

The success of supply management or planned production to meet an anticipated demand is dependent upon the cooperation of everyone in the marketing continuum from producer to consumer. The Board must first accurately forecast future sales and then allocate production quotas based on the forecast. A high level of management is required from producers to keep death losses below 5 percent and to market the weight of birds desired by the consumer. An accurate up-to-date flow of information is needed to assist processors in decisions with regard to inventory control and daily plant operations. A responsibility also exists with wholesalers and retailers to see that information regarding changes in the product desired by consumers is transmitted back to the Board and processors in order that adjustments may be made throughout the marketing chain. The Alberta broiler industry is also dependent upon the broiler industry in other provinces practising orderly production and marketing. If all segments of the industry cooperate overall market efficiency in the broiler industry may be increased by sound supply management.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Six problems facing the Alberta broiler industry were identified in Chapter I. The following are conclusions drawn from the research.

Sales Forecasting

Future sales of broilers have been forecast within a 2 percent error level up to one year in advance by means of a regression model based on quarterly sales of broilers over time and dummy variables for seasonality. Even greater accuracy in predicting future sales is possible if the forecasting technique is used on a quarterly basis and new demand data are used in the regression model as they become available. The inclusion of population, price of broilers and price of competing meat products as variables in the regression model severly hampers the models usefulness as a forecasting technique.

Inventory Levels

The Board's current policy of maintaining high

inventory levels in order to prevent imports from coming into the province has been unsuccessful. The practise of maintaining high inventory levels is also decreasing the operational efficiency within the industry by imposing unnecessary storage charges. Inventory levels could be reduced to one million pounds and still adequately service customers. The inventory should be in a 2 to 1 ratio, whole to cut-up and segments.

Market Information

Institutional and take-out restaurant outlets account for a larger volume of Alberta broiler sales than the same outlets do of the United States' sales. Also, a larger volume of birds slaughtered in Alberta are federally inspected.

The demand for broiler chickens is not constant throughout the year. Sales are greatest in the summer and lowest in the winter. Changes in demand for the various forms of chicken also occur during the year.

Knowledge of the seasonality and composition of the demand for broilers and the outlets through which they are sold indicates several areas where advertising and promotion may be effectively used to increase the total yearly demand for broilers and at the same time bring about increased seasonal stability.

Sales to areas outside Alberta account for a large portion of Alberta's market. Over fourteen percent of the industry's market is outside the Province of Alberta.

Institutions do not purchase cut-up birds. They either purchase segments or else whole birds and cut them up themselves.

There is an inadequate supply of current market information available to processors on which to base their day to day operational decisions.

Interprovincial Movement of Broilers

The Board's efforts to stabilize the supply and price of Alberta broilers is susceptible to the importation of product from other provinces. The "dumping" of product by other provinces results in depressed prices. The restriction of interprovincial movement of broilers along provincial boundaries must be discouraged. The economic forces of cost must be allowed to operate unhindered in deciding market areas. Alberta's market for broilers will decrease by 14.3 percent if artificial provincial boundaries are imposed as market areas.

Recommendations

In an effort to increase the market efficiency within the Alberta broiler industry, the following recommendations are made:

(1) Future campaigns to expand the demand for broilers should be aimed at the fall and winter season in order to stabilize demand throughout the year. This minimizes the need to construct more facilities which will be under-utilized during the fall and winter periods when cutbacks in production are necessary to avoid excess supply and resulting price instability. Decreased sales of cut-up and segmented chicken in the fall and of segments in the winter suggest that campaigns be carried out during the fall and winter to expand the demand for these cuts of chicken. Wholesalers should be encouraged to increase sales during the fall and winter.

(2) A representative of the Kentucky Fried Chicken franchises in Alberta should be added to the industry advisory committee because of the importance of this group as an outlet for Alberta broilers. The entire industry is highly vulnerable to the actions of theis group and they should therefore be included in future planning.

(3) The Board should press for inclusion of regulations governing the interprovincial movement of broilers in

regulations establishing a national marketing agency.

(4) Inventories should be reduced to one million pounds by temporary cut-backs in production quotas.

(5) The Board should utilize modern telecommunication and data processing techniques to increase the usefulness of the Weekly Report to Processors. The timeliness of the Report may be vastly improved by elimination of the mails as a means of data collection and the substitution of modern telecommunication techniques, including Telex, as a means of gathering information on inventories and sales from the processors. The data could be fed into a time-sharing computer system, such as the MTS computer system used by the University of Alberta, for processing and transmission of the output back to the processors by the same Telex used for data collection. If information with regards to sales and inventories were provided by processors on Friday night, this system would provide them with up-to-date information on which to plan the next week's operations early Monday morning.

Recommendations For Further Research

While this research has answered some questions and recommended some means of increasing operational and overall market efficiency within the Alberta broiler industry, it

has also raised numerous questions which require answers. The analysis of seasonality of sales and the form in which the product is sold has not been able to show where the 11 percent of the product being sold to wholesalers is finally consumed. Also, the fact that institutions do not purchase cut-up chicken suggests that further research is necessary to determine whether the margin between whole and cut-up chicken charged by the processors has any relationship to the actual cost of cutting up the chicken. Development of forecasting techniques to predict future sales and the subsequent relation of the forecasted sales back to quota allocation raises many questions. How does the setting of placements at between 85 and 110 percent of quota affect the actual number of birds finally marketed after accounting for death losses? Also, because forecasts are based on the number of pounds of eviscerated chicken sold while quota must be allocated on the basis of the number of birds a producer is authorized to place, what is the effect of feed prices on the weight of bird marketed?

Reduced sales of segmented and cut-up chicken by retail stores as opposed to chain stores suggests that research be carried out on the merchandising techniques utilized by these two outlets. Are the reduced sales by retail stores because the different forms simply are not displayed in the smaller stores? Finally, increased research into the marketing efforts of all broiler producing areas within

Canada and coordination of these production and marketing efforts is necessary.

SELECTED REFERENCES

Alberta Broiler Growers' Marketing Board. Report to the Fifth Annual General Meeting of Producers Registered under the "Alberta Broiler Growers' Marketing Plan 1965." Edmonton, Alberta: Alberta Broiler Growers' Marketing Board, 1971.

Alberta Broiler Growers' Marketing Board. Six Years of Progress: Annual Report. Edmonton: Alberta Broiler Growers' Marketing Board, 1972.

Alberta Broiler Growers' Marketing Board. Weekly Report to Processors Edmonton, Alberta: Broiler Growers' Marketing Board, 1971.

Alberta Government. The Marketing of Agricultural Products Act. "Alberta Broiler Growers' Marketing Plan 1965" Established, Alberta Regulation 17/66, January 13, 1966. Extract from The Alberta Gazette, Jan. 31, 1966.

Bain, Joe S. Industrial Organization New York: John Wiley and Sons, Inc., 1959.

Beckman, Theodore N. and William R. Davidson. Marketing 8th Ed.; New York: The Ronald Press Company, 1967.

Buck, John T. Marketing Poultry Meats in Retail Food Stores in Non-Metropolitan Areas in Virginia. Research Bulletin 488. Blacksburg, Virginia: Virginia Polytechnic Institute, April, 1958.

Caves, Richard. American Industry: Structure, Conduct, Performance. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1967.

Clark, J.M. Competition as a Dynamic Process Washington, D.C.: The Brookings Institute, 1961.

Clark, J.M. "Toward a Concept of Workable Competition." American Economic Review, XXX (1940), 241-256.

Ferguson, C.E. Microeconomics Theory 3rd Ed.; Georgetown, Ont.: Irwin-Dorsey Ltd., 1972.

Hurnanen, Roy R. "Vertical Integreation and Concentration in the Alberta Broiler Industry." Unpublished M.Sc. thesis, Department of Agricultural Economics and Rural Sociology, University of Alberta, Edmonton, 1970.

Klein, L.R. Econometrics. Evanston, Illinois: Row, Peterson and Co., 1953.

Kohls, Richard L. and W. David Downey. Marketing of Agricultural Products. 4th Ed.; New York: The MacMillan Company, 1972.

Ladd, George W. and James E. Martin. Application of Distributed Lag and Autocorrelated Error Models to Short-Run Demand Analysis. Research Bulletin 526. Ames, Iowa: Iowa State University, 1964.

Low, Richard E. Modern Economic Organization. Homewood, Illinois: Richard D. Irwin, Inc., 1970.

Pauls, Daniel E. and Albert H. Harrington. Merchandising Poultry: Jumbo Young Chicken. Circular 454 Pullman, Washington: Washington State University, 1965.

Richmond, Samuel B. Statistical Analysis. New York, New York: The Ronald Press Co., 1964.

Rizvi, Saiyed M.H. "Marketing Boards in Canada--An Evaluation of Their Quota Policies with Special Reference to the Broiler Chicken Industry." Unpublished Ph.D. thesis, Department of Agricultural Economics and Rural Sociology, University of Alberta, Edmonton, 1974.

Rogers, George B. and Frank M. Conley. "Marketing Poultry and Eggs." Agricultural Markets in Change. Report No. 95. Washington: U.S. Department of Agriculture, July, 1966, pp. 329-368.

Samuelson, Paul A. and Anthony Scott. Economics: An Introductory Analysis. Canadian Edition; Toronto: McGraw-Hill Co., Ltd., 1966.

Sosnick, Stephen H. "Toward a Concrete Concept of Effective Competition." American Journal of Agricultural Economics, Vol. 50, No. 4 (November, 1968), 827-853.

Stanton, B.F. "Seasonal Demand for Beef, Pork and Broilers." Agricultural Economics Research. Vol. 13, No. 1 (January, 1961), 1-14.

Statistics Canada. Survey of Poultry Processors, Annual Census. Cat. No. 32-227 Ottawa: DBS, 1969.

Warrack, Allan A. "A Conceptual Framework for Analysis of Market Efficiency." Canadian Journal of

Agricultural Economics, Vol. 20, No. 3 (1972) 9-21.

Williams, Willard F. and Thomas T. Stout. Economics of the Livestock - Meat Industry New York: The MacMillian Co., 1964.

APPENDIX A

POLICY FOR THE ALLOTMENT OF NEW QUOTAS FOR THE MARKETING OF BROILER AND ROASTER CHICKENS IN ALBERTA[1]

Marketing quotas will be offered according to the policy that follows, but before quota is issued, one square foot of suitable growing space per unit must be available in the case of broiler chickens and one and one-half square feet for roaster chickens. Growers will be given a reasonable period of time to construct this space before a quota offering is withdrawn. The length of time will depend upon the time of year, the circumstances of the individual and the need for the product.

Growers will be offered broiler chicken or roaster chicken quotas but not both at the same time. Some growers who have a broiler chicken quota will be offered a roaster chicken quota; however, the Board will attempt to keep production facilities for the two classes of chicken as separate as possible for disease control considerations.

Initial roaster chicken quota will be allocated on a regional basis according to the estimated demand for product in the three marketing centres of Lethbridge, Calgary and

---

[1] Alberta Broiler Growers' Marketing Board, Six Years of Progress: Annual Report (Edmonton: Alberta Broiler Growers' Marketing Board, 1972).

Edmonton. No regional considerations will be taken into account in offering broiler chicken quota.

Initial offerings of roaster chicken quota will be made to growers who have marketed roaster chicken under permit to the Board on a regular basis for the past three years. Initial offerings to these growers will be based on the historic production of these growers.

All other new quota offerings will be made to two classes of growers as market conditions warrant. Allocations will be made as follows:

A. At least 35 percent of the total of each allocation (broilers plus roasters) to be offered to new growers as follows:

(i) In lots of 6,000 square feet.
This will allow the marketing of 6,000 broiler chicken or 4,000 roasting chicken per cycle when the marketing quota is set at 100 percent.

(ii) In order of application received in the Board Office beginning at the commencement of Board operations. In the case of roaster chicken quota, location will also be taken into account.

At the time of offering or within a reasonable time thereafter (at the discretion of the Board), the successful applicant must:

(a) own the farmland and facilities where he

will raise the regulated product, or else have a long term lease agreement for the buildings in which the birds will be raised.

(b) the facilities must be entirely separate from any other facilities used to raise the regulated product by any other registered grower.

(c) derive his major net income from farming or satisfy the Board that he will eventually derive his major net income from farming.

N.B. If a potential new grower is unable to satisfy these requirements, the Board at its discretion will either remove his name from the list of applicants or leave it on with no change in numerical position for future consideration.

B. Priority rating for the balance of each quota offering to existing quota holders will be as follows:

In lots of 3,000 square feet offered in the following order:

(i) Growers with continuous quota allocations since 1966 presently less then 10,000 square feet in order from smallest present quota under 10,000 square feet (16 growers).

(ii) Growers who accepted their first quota in 1969 (7 growers).

(iii) Growers at more than 10,000 square feet and less than 15,000 square feet in order from smallest present quota (21 growers).

Growers at more than 15,000 square feet and less than 20,000 square feet in order from smallest present quota (13 growers).

(vi) Growers who accepted their first quota in 1971 (7 growers).

(vii) Remaining growers in order from smallest to largest except those who are owned in whole or in part or are effectively controlled by a company or individual that has been allocated more than 3 percent of the total of all outstanding quota at the time quota is offered (14 growers).

C. General rules

(i) Each time quota increases are offered, present quota holders who have not taken advantage of a previous offer will be given the opportunity to take up these previous allocation offers. Notwithstanding this, no grower will be allowed to accept more than two offerings at any one time.

(ii) The total amount of quota offered will depend upon anticipated market demands and will be at the discretion of the Board.

(iii) In the event of any change in ownership or lease agreement, the quota affected automatically reverts to the Board. The Board in its discretion may or may not reallocate the quota to the present or the new owner or lessee.

(iv) Marketings from new quota allocations are to commence at such time as the Board considers it is warranted by market conditions.